

We claim:

5 1. A shock absorber, comprising:

a primary housing having a primary internal cavity containing a fluid, a first end, and an opposite second end;

a piston assembly disposed within said primary internal cavity, said piston assembly traveling within said primary internal cavity, said piston assembly partitioning said primary  
10 internal cavity into a first chamber disposed adjacent to said first end of said primary housing, and a second chamber disposed adjacent to said second end of said primary housing;

a shock rod connected to said piston assembly, said shock rod passing through said second end of said primary housing;

a secondary housing having a secondary internal cavity, a first end, and an opposite  
15 second end;

a piston disposed within said secondary internal cavity, said piston traveling within said secondary internal cavity, said piston partitioning said secondary internal cavity into a first chamber disposed adjacent to said first end of said secondary housing, and a second chamber disposed adjacent to said second end of said secondary housing;

20 said second chamber containing a compressible fluid;

a flow regulator connected between said first chamber of said primary housing and said first chamber of said secondary housing, said flow regulator controlling a flow of said fluid between said first chamber of said primary housing and said first chamber of said secondary housing;

25 said flow regulator including a body which receives a flow control member;

said flow control member having a plurality of orifices of different sizes; and,

wherein said flow control member may be selectively positioned to cause said fluid to flow through one of said orifices from said first chamber of said primary housing to said first chamber of said secondary housing.

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2. A shock absorber according to Claim 1, further including:  
said body having an entry port and an exit port;  
said flow control member including a cylinder having an outside surface and a plurality of bores, each said bore connected to said outside surface by one of said orifices; and,  
5 wherein said cylinder may be selectively rotated so that one of said orifices aligns with said exit port, so that said fluid flows from said first chamber of said primary housing, through said entry port, through said bore connected to said aligned orifice, through said aligned orifice, through said exit port, and into said first chamber of said secondary housing.
- 10 3. A shock absorber according to Claim 2, further including:  
said cylinder including a circular channel which connects said entry port with each of said bores.
4. A shock absorber according to Claim 2, further including:  
15 a rotatable member connected to said cylinder;  
a detent mechanism connected between said rotatable member and said body; and,  
so that, using said rotatable member, said cylinder may be selectively rotated to a flow position corresponding to one of said orifices, wherein said detent mechanism urges said cylinder to remain in said selected flow position.
- 20 5. A shock absorber according to Claim 2, further including:  
said plurality of orifices including seven said orifices circumferentially spaced around said cylinder.
- 25 6. A shock absorber according to Claim 2, further including:  
a one way valve which permits said fluid to flow from said first chamber of said secondary housing to said first chamber of said primary housing.
7. A shock absorber according to Claim 6, further including:  
30 said one way valve including:

- said cylinder including a circular channel which connects said entry port with each of said bores.
  - a no orifice bore which is not connected to a said orifice;
  - an aperture centrally disposed in said cylinder, said aperture connected to said no orifice bore;
  - a hollow member having an first inside diameter accepted by said aperture, said hollow member having an open end and an opposite head end, said head end having a hole having a second diameter less than said first inside diameter;
  - a spherical member disposed within said aperture, said spherical member having a third diameter less than said first inside diameter and greater than said second diameter;
  - wherein said fluid may flow from said first chamber of said secondary housing, through said hole in said hollow member, through said hollow member, through said no orifice bore, through said circular channel, through said entry port, and into said first chamber of said primary housing; and,
  - wherein said spherical member lodges in said hole to prevent said fluid from flowing from said entry port to said first chamber of said secondary housing via said hollow member.
8. A shock absorber according to Claim 2, further including:  
said flow regulator including a safety valve which opens allowing fluid to flow from said entry port to said first chamber of said secondary housing when said first chamber of said primary housing experiences a predetermined pressure level.
9. A shock absorber according to Claim 8, further including:  
said safety valve including at least one bypass washer which covers said bores;  
wherein when said predetermined pressure level is reached, said bypass washer bends to allow said fluid to travel from said entry port through each of said bores and into said first chamber of said secondary housing.

10. A shock absorber according to Claim 1, further including:

said body having an entry port and an exit port;

said flow control member including a cylinder having an outside surface and a plurality of bores, each said bore connected to said outside surface by one of said orifices; and,

5 wherein said cylinder may be selectively rotated so that one of said orifices aligns with said exit port, so that said fluid flows from said first chamber of said primary housing, through said entry port, through said bore connected to said aligned orifice, through said aligned orifice, through said exit port, and into said first chamber of said secondary housing.

said cylinder including a circular channel which connects said entry port with each of  
10 said bores;

a rotatable member connected to said cylinder;

a detent mechanism connected between said rotatable member and said body, so that, using said rotatable member, said cylinder may be selectively rotated to a flow position corresponding to one of said orifices, wherein said detent mechanism urges said cylinder to  
15 remain in said selected flow position;

a one way valve which permits said fluid to flow from said first chamber of said secondary housing to said first chamber of said primary housing; and,

said flow regulator including a safety valve which opens allowing said fluid to flow from said entry port to said first chamber of said secondary housing when said entry port is  
20 exposed to a predetermined pressure level.

11. In a shock absorber of the type having (1) a primary housing having a primary internal cavity containing a fluid, a first end, and an opposite second end, (2) a piston assembly disposed within the primary internal cavity, the piston assembly traveling within the primary  
25 internal cavity, the piston assembly partitioning the primary internal cavity into a first chamber disposed adjacent to the first end of the primary housing, and a second chamber disposed adjacent to the second end of the primary housing, (3) a shock rod connected to the piston assembly, the shock rod passing through the second end of the primary housing, (4) a secondary housing having a secondary internal cavity, a first end, and an opposite second end,  
30 (5) a piston disposed within the secondary internal cavity, the piston traveling within the

secondary internal cavity, the piston partitioning the secondary internal cavity into a first chamber disposed adjacent to the first end of the secondary housing, and a second chamber disposed adjacent to the second end of the secondary housing, and (6) the second chamber containing a compressible fluid, the improvement comprising:

5           a flow regulator connected between the first chamber of the primary housing and the first chamber of the secondary housing, said flow regulator controlling a flow of the fluid between the first chamber of the primary housing and the first chamber of the secondary housing;

          said flow regulator including a body which receives a flow control member;

10           said flow control member having a plurality of orifices of different sizes; and,

          wherein said flow control member may be selectively positioned to cause the fluid to flow through one of said orifices from the first chamber of the primary housing to the first chamber of the secondary housing.